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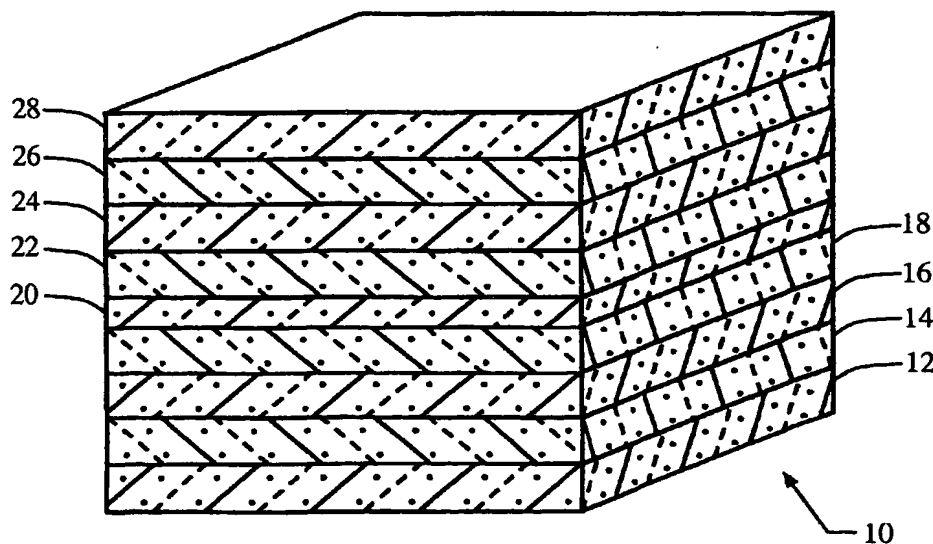
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[Continued on next page]

(54) Title: CHARGE CONTROLLED AVALANCHE PHOTODIODE AND METHOD OF MAKING THE SAME



(57) Abstract: The present invention includes an epitaxial structure (16) grown on a semi-insulating InP substrate (12). First, a buffer layer (14) is grown to isolate defects originated from substrates (12). Then an n-type layer (18) is grown to serve as n-contact layer to collect electrons. Next, a multiplication layer (20) is grown to provide avalanche gain for the APD device (10). Following that, an ultra-thin charge control layer (22) is grown with carbon doping. An absorption layer (24) is grown to serve as the region for creating electronhole pairs due to a photo-excitation. Finally, a p-type layer (28) is grown to serve as p-contact layer to collect holes.

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A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : H01L 21/18; H01L 31/107

US CL : 257/186; 257/438

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 257/186; 257/438

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
STN; Dialog; EAST

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 6,326,650 B1(ALLAM) 04 December 2001 (04.12.2001), columns 1-33.	1-19
X	US 5,654,578 A (WATANABE) 05 August 1997 (05.08.1997), column 8, lines 25-68.	1-19
A	US 5,365,077 A (METZGER et al.) 15 November 1994 (15.11.1994), columns 1-7	1-19

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